REMARKS

The Office Action dated November 26, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 73, 74, 76, 83, 84-86, 94, 96, 98, 100, 101, 102 and 104 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added and no new issues are raised which require further consideration or search. Claims 73-104 are presently pending and are submitted for reconsideration.

The Office Action objected to claims 74-78, 84-88, 94-96, 98-100 and 102-104 for containing allowable subject matter but depending from a rejected base claim. Applicants thank the Examiner for the indication of allowable subject matter. However, all of the rejected pending claims are submitted for reconsideration.

The Office Action objected to claims 73, 83, 85 and 90 for containing minor informalities, such as, grammatical errors and improper dependency. Applicants have amended those claims to correct those informalities. Withdrawal of the objections is kindly requested.

Claims 73, 79, 82, 83, 92, 93 and 101 were rejected as being allegedly unpatentable over U.S. Patent Publication No. 2002/0110101 (Gopalakrishnan) in view of U.S. Patent Publication No. 2003/0231586 (Chheda) and U.S. Patent No. 5,138,311 (Weinberg) and further in view of "Dynamic Assignment of Orthogonal Variable-Spreading-Factor Codes in W-CDMA", August 2000 (Minn). Referring, for example, to

claim 73, the Office Action took the position that Gopalakrishnan and Chheda disclose all limitation of this claim except measuring various channel metrics and relied on Weinberg and Minn to cure those deficiencies of Gopalakrishnan and Chheda. However, as described in greater detail below, the combination of Gopalakrishnan, Chheda, Weinberg and Minn fails to disclose each and every limitation recited in an of the pending claims.

Claim 73, from which claims 74-82 depend, relates to a method that includes adaptive setting reservation of channelization codes or allowed power for a downlink shared channel, based on parameters for a minimum allowed spreading factor or an allowed power level, and setting the parameters depending on traffic load, a total load of a cell, and availability of channelization codes. Measured quantities include an average transmitted power of a physical downlink shared channel, a relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period, and a weighted code blocking rate, the weighted code blocking rate that includes a relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel. At least one of a root spreading factor and allowed power for the downlink shared channel of a transceiver are adaptively adjusted based on results of the measuring.

Claim 83, from which claims 84-92 depend, relates to an apparatus, that includes a setter configured to adaptively set reservation of channelization codes or allowed power for a downlink shared channel based on parameters for minimum allowed spreading

factor and allowed power level, depending on traffic load, a load of a cell and availability of channelization codes. A measurer in the apparatus is configured to measure factors including average transmitted power of a physical downlink shared channel, relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period, and a weighted code blocking rate, the weighted code blocking rate representing the relative time during observation period where a larger bit rate than the actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel. Also, the setter is further configured to adjust at least one of a root spreading factor and allowed power for the downlink shared channel based on results of the measurement.

Claim 93, from which claims 94-96 depend, relates to an apparatus that includes setting means for adaptively setting reservation of channelization codes or allowed power for a downlink shared channel based on parameters for minimum allowed spreading factor or allowed power level, depending on traffic load, a load of a cell and availability of channelization codes. The apparatus further includes measuring means for measuring average transmitted power of a physical downlink shared channel, relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period, and weighted code blocking rate, the weighted code blocking rate comprising the relative time during observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a

link adaption criteria for controlling the downlink shared channel. Adjusting means in the appatratus are for adjusting a root spreading factor and allowed power for the downlink shared channel based on the measuring.

Claim 101, from which claims 102-104 depend, relates to a computer program embodied on a computer-readable medium that includes computer-executable components for adaptive setting reservation of channelization codes or allowed power for a downlink shared channel, based on parameters for a minimum allowed spreading factor or an allowed power level, and setting the parameters depending on traffic load, a total load of a cell, and availability of channelization codes. Quantities are measured, including an average transmitted power of a physical downlink shared channel, a relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period, and a weighted code blocking rate, the weighted code blocking rate comprisaing a relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel. At least one of a root spreading factor and allowed power for the downlink shared channel of a transceiver are adaptively adjusted based on results of the measuring.

As described below, Gopalakrishnan, Chheda, Weinberg and Minn do not teach or suggest the claimed subject-matter.

Gopalakrishnan generally discloses a system providing data rate determination. Available power fraction and available Walsh codes in each active leg are dynamically

changing over time. Applicants note that Gopalakrishnan generally relates to a conventional technique in which the rate is adapted based on a combined resource of levels at each cell (i.e., power and code space).

As admitted in the Office Action, Gopalakrishnan does not contain any disclosure of various features recited in the claims, for example, there is no disclosure of adjusting allowed power, and measuring channel metrics that include an average transmitted power of a channel, a relative activity factor, and a weighted code blocking rate. The Office Action then relied on Chheda as allegedly disclosing adjusting allowed power.

Chheda relates to maximizing the number of communication sessions in a telecommunications network that includes multiple protocols that each utilize a certain number of codes and a certain amount of power. The desirability of each protocol may vary depending on the number of codes and the amount of power available. A code usage level and a power usage level for the network are obtained and compared to determine whether the network is using a higher percentage of the available codes or a higher percentage of the available power. If a higher percentage of codes are in use, a new session may be established using a protocol that uses relatively few codes but more power. Likewise, if a higher percentage of power is in use, the new session may be established using a protocol that uses relatively little power but more codes.

The Office Action then admitted that neither Gopalakrishnan nor Chheda discloses or suggests measuring various channel metrics to include measuring a relative activity factor of a channel that defines the ratio between silence and activity of the channel during an observation period, and a weighted code blocking rate defining a relative time

during an observation period in which a larger bit rate than the bit rate actually allocated could have been allocated to a user equipment (see page 8, lines 1-7 of the Office Action). The Office Action then proceeded to rely on Weinberg and Minn to cure those admitted deficiencies of Gopalakrishnan and Chheda. Applicants submit that Weinberg and Minn fail to cure the deficiencies of Gopalakrishnan and Chheda with respect to any of the independent claims 73, 83, 93, 97 and 101.

Weinberg discloses a communication system that includes an input (202) for requesting and receiving a first message information format, and for requesting and receiving a second message information format. The system also includes a controller (210) for detecting a measure of communication activity and for comparing the measure of communication activity to a threshold that is adaptable by the controller (210) as a function of the communication activity. The communication system accepts the first message information format when the measure of communication activity is below the threshold (604, 610, 606, and 608), and accepts the second message information format when the measure of communication activity is above the threshold (604, 610, 612, 614, and 616).

The Office Action specifically referenced Weinberg at FIGS. 4A-4B, column 8, lines 1-30, and column 2, lines 54-column 3, line 3, as allegedly disclosing "identifying relative times of metrics of a channel during an observation period" and "wherein a metric is the ratio of silence and activity." Applicants disagree and submit that Weinberg relates to scheduling network resources (i.e., timing transmission of a message) and not to using the relative activity level to adjust power. Weinberg also does not relate to

observing any of the downlink channels, as recited in certain embodiments of the present invention.

In particular, Weinberg does not relate to a root spreading factor or allowed power, and does not disclose a measurement of a ratio between silence and activity of a physical downlink shared channel during the observation period. Weinberg does not disclose or suggest "adaptive setting reservation of channelization codes or allowed power for a downlink shared channel based on parameters for a minimum allowed spreading factor or an allowed power level...measuring an average transmitted power of a physical downlink shared channel...measuring a relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period", as recited, in indepenent claim 73 and similarly in independent claims 83, 93, 97 and 101.

Referring to column 8, lines 1-12 and lines 51-61 and column 9, lines 21-38 of Weinberg, it is disclosed that:

> "Referring to FIGS. 4A and 4B, two timing diagrams illustrate possible <u>paging channel utilizations</u> for the exemplary paging system. Channel activity 400, in FIG. 4A, may be relatively high as compared to idle time 402 for the paging system channel, indicting a busy paging system. Moreover, channel activity 410 relative to idle time 412, in FIG. 4B, represents a relatively low paging system channel utilization. Hence, the ratio of active (400 and 410) to idle (402 and 412) times for the exemplary paging system may serve to indicate the level of communication activity for the available system resources....
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> Therefore, an inventive paging terminal 200 may be able to better manage the available paging system resources (e.g., memory 224 and 232; and paging channel activity 400

and 410) by using the peak-period time interval as a performance criteria, and therefore, receiving and accepting those incoming page requests having message formats that optimally consume the available resources during the respective time intervals. In this fashion, more paging traffic may be handled with the existing system resources, as will be more fully discussed below....

If the requested pager address and message format is a "short" message format, the page is normally accepted and processed (604, 606, and 608). However, a requested "long" message format (i.e., determined to be an inefficient use of the available system resources) requires measuring the current level of communication activity (e.g., memory utilization, paging channel utilization, and/or detection of a peak-period time interval), and comparing the measure of communication activity to a threshold 610. The threshold level of activity may be either predetermined (e.g., 90% of memory in use, 80% of paging channel utilization, or within a peak-period time interval), or the threshold may be adaptively set by the paging terminal controller 210, as is more fully hereinafter discussed. Hence, if the measure of communication activity is determined at or below the threshold 610, the page request is accepted and processed (606 and 608). When the measure of communication activity is determined above the threshold 610, the "long" message format is unacceptable under those conditions."

As may be clearly observed from the above-noted excerpt of Weinberg's disclosure, Weinberg is related to a different set of communication activity and operating procedures than those recited in the pending claims. The message formats are determined to be either short or long, and depending on this distinction, the page may or may not be accepted and/or processed. Weinberg may describe detecting a communication activity, but since Weinberg is silent regarding any physical downlink shared channel, Weinberg cannot suggest measuring a relative activity factor of the physical downlink shared channel (i.e., a ratio between silence and activity of a physical downlink shared channel

during the observation period). In addition, Weinberg also cannot suggest using a measurement to adjust a root spreading factor and/or an allowed power for the downlink shared channel. In this fashion, more paging traffic may be handled with the existing system resources.

In addition to the above-noted deficiencies of Weinberg, it has already been admitted in the Office Action that Gapalakrishnan, Chheda and Weinberg together still fail to disclose "measuring a weighted code blocking rate, the weighted code blocking rate comprising a relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel" as recited in indepenent claim 73 and similarly in independent claims 83, 93, 97 and 101. With respect to this feature, the Office Action relied on Minn. Applicants disagree that Minn cures the deficiencies of Gapalakrishnan, Chheda and Weinberg with respect to the pending claims.

Referring to Minn, an optimal dynamic code assignment (DCA) scheme is proposed that reassigns codes in variable spreading factor codes (OVSF) of a CDMA-based system such that code blocking is completely eliminated. This scheme is aimed at minimizing the number of OVSF codes that must be reassigned to support a new call. The optimal criterion is based on the fact that control signaling overhead and system complexity are reduced by minimizing the number of OVSF codes that must be reassigned while calls are in progress. The quantization constraint on the available data rates in an OVSF-CDMA system may be removed by applying medium-access

techniques such as "time slotting" and "pseudorandom time hopping" (see paragraph four of Section I (introduction)).

The remainder of Minn's paper is organized as follows. In Section II, the generation of orthogonal Walsh codes is described by using a code-tree structure [7], and code blocking is also discussed. In Section III, a proposed dynamic code assignment (DCA) scheme is introduced and proven to be optimal in minimizing the number of reassigned OVSF codes. In addition, a suboptimal DCA scheme of less computational complexity is also introduced. (see page 1429, right column, last paragraph of Minn).

Minn describes code blocking in general as a condition that blocks a new call even though the system has excess capacity to support the rate requirement of the call (see page 1431, right column, last paragraph of Section II of Minn). Minn further describes a dynamic code assignment technique that may alleviate some of the constraints experienced by call blocking. Minn simply fails to disclose the operations of measuring a weighted code blocking rate and using that blocking rate to adaptively adjust a root spreading factor and/or an allowed power for the downlink shared channel. The general statements and design considerations disclosed in Minn regarding dynamic code assignment are not comparable to the features recited in the pending claims.

Minn does not disclose or suggest "measuring a weighted code blocking rate, the weighted code blocking rate comprising a relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel" as recited in indepenent claim 73 and similarly in independent claims 83, 93, 97

and 101. Therefore, a combination of all cited references Gapalakrishnan, Chheda, Weinberg and Minn do not disclose or suggest the features of measuring a relative activity factor, measuring a weighted code blocking rate and adaptively adjusting a root spreading factor and/or allowed power for the downlink channel.

For at least these reasons, claim 73 is allowable over the combination of Gapalakrishnan, Chheda, Weinberg and Minn. Similarly, independent claims 83, 93, 97, and 101, although patentably distinct from claim 73, also recite limitations related to measuring average transmitted power and a relative activity factor and are allowable over Gapalakrishnan, Chheda, Weinberg and Minn on a similar basis. Likewise, each of dependent claims 74-82, 84-92, 94-96, 98-100, and 102-104 are allowable as depending from an allowable claim, as well as for the separate limitations recited in these claims. Accordingly, consideration and allowance of claims 73-104 are respectfully requested.

Claims 80, 81, 90 and 91 were rejected as being allegedly unpatentable over Gopalakrishnan, Chheda, Weinberg, Minn and further in view of U.S. Patent Publication No. 2002/0089952 (Cao). For example, the Office Action alleged that the combination of Gopalakrishnan, Chheda, Weinberg and Minn disclosed all of the features of the claims except for assigning codes for downlink in a code tree starting from a certain limb of a code tree, and codes are assigned for used in another limb of the code tree. The Office Action then relied on Cao to cure those deficiencies of Gopalakrishnan, Chheda, Weinberg, Minn. However, as described in greater detail below, the combination of Gopalakrishnan, Chheda, Weinberg, Minn and Cao fails to disclose each and every limitation recited in an of the pending claims.

Cao relates to relates to packet transmission scheduling and specifically to UMTS packet transmission scheduling. It is an object of the invention to provide an improved method for packet transmission scheduling, especially on downlink shared channels and an improved packet transmission scheduling system, both the improved method and the system especially adapted to be used for UMTS systems. The invention proposes a quality of service scheduling of multiple data flows in a CDMA system, wherein a priority order of protocol data units (PDU) of multiple data flows with regard to predefined flow's quality of service requirements is determined and a serving of the protocol data units (PDU) is performed by dynamically creating is transport block sets (TBS) to be transmitted to the physical layer (PHY-layer) with regard to the defined priority order and in dependence of allocated radio resource constraints.

Thus, Cao does not make up for the above-described limitations in Gopalakrishnan, Chheda, Weinberg and Minn since Cao does not teach or suggest "measuring a weighted code blocking rate, the weighted code blocking rate comprising a relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel" as recited in indepenent claim 73 and similarly in independent claims 83, 93, 97 and 101. For at least these reasons, independent claims 73 and 83 are allowable over the combination of Gopalakrishnan, Chheda, Weinberg, Minn and Cao. Likewise, dependent claims 80, 81, 90 and 91 should therefore also be allowable over the combination of Gopalakrishnan, Chheda, Weinberg, Minn and Cao.

Claim 97 was rejected as being allegedly unpatentable over Chheda, Weinberg and further in view of Minn. The Office Action took the position that Chheda and Weinberg disclose all limitations of this claim except "a weighted code blocking rate, the weighted code blocking rate representing the relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel" as recited in indepenent claim 97. The Office Action then took the position that Minn cures those deficiencies of Chheda and Weinberg. This rejection is respectfully traversed.

Claim 97, from which claims 98-100 depend, relates to an apparatus, configured to measure average transmitted power of a physical downlink shared channel, relative activity factor of the physical downlink shared channel, the relative activity factor defining the ratio between silence and activity of the physical downlink shared channel during an observation period. The apparatus also measures a weighted code blocking rate, the weighted code blocking rate representing the relative time during observation period where a larger bit rate than the actually allocated bit rate could have been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel.

As noted in detail above, Min does not disclose or suggest "a weighted code blocking rate, the weighted code blocking rate representing the relative time during an observation period in which a larger bit rate than an actually allocated bit rate could have

been allocated to a user equipment according to a link adaption criteria for controlling the downlink shared channel" as recited in indepenent claim 97

Minn simply fails to disclose the operations of measuring a weighted code blocking rate that represents the time during an observation period in which a larger bit rate than actually allocated could have been allocated. Minn does not disclose that a larger bit rate was a possibility and that it could have been allocated. Minn also does not disclose that the user equipment could have been provided this larger bit rate according to a link adaption criteria to control the downlink shared channel. The general statements and design considerations disclosed in Minn regarding dynamic code assignment are not comparable to the features recited in the pending claims. This rejection is clearly improper and must be withdrawn for failing to properly address the claim recitations of independent claim 97.

As discussed above, each of the pending claims 73-104 recites subject matter which is neither disclosed nor suggested in any of the cited references. Applicants submit that the recited subject matter is more that sufficient to render the invention non-obvious to a person of ordinary skill in the art. It is respectfully requested that claims 73-104 therefore be allowed in view of the above amendments and remarks, and that the present application be passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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